3. ROUTE OF INHALED AIR TO MECHANISM OF BREATHING

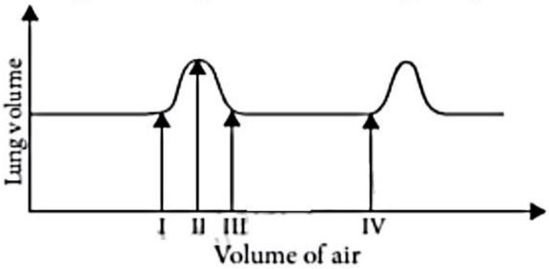
CASE STUDY

Refer for Q1 and Q2 We need energy to perform various activities. This energy is derived from the catabolism of various components of food eg Proteins, carbohydrates, fats etc. Oxygen is required for catabolic processes and CO_2 is released in the process, so the body requires a continuous exchange of gases, oxygen from the atmosphere is taken inside and CO_2 produced is given out . In human beings respiratory pigments called haemoglobin present in RBC has very high affinity for oxygen . In tissues exchange of gases occurs between oxygenated blood and tissue cells

1. People living at sea level have around 5 millions RBC per cubic millimetre of their blood whereas those living at an altitude of 5400 metres have around 8 million. this is because at high altitude
(A) People eat more nutritive food therefore more RBC`s are formed
(B) People get pollution free air to breathe and more oxygen is available
(C) Atmospheric 02 level is less and hence more RBC`s are needed to absorb the required amount of O2 to survive
(D) There is more UV radiation which enhances RBC production

2. Which of the following has highest affinity for haemoglobin?
(A) O_2 (B) CO_2 (C) CO D) All of these

3. The given graph illustrates the changes in lung volume during the process of breathing



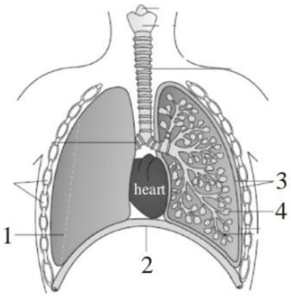
The changes from II to III indicates the
(A) Movement of diaphragm away from the lungs
(B) Expansion of thoracic cavity
(C) Movement of air out of the lungs
(D) Expansion of ribs

4. Which of the following sequences is correct to initiate inspiration ?
(I) The contraction of intercostal muscle raises the ribs and sternum
(II) Volume of thorax increases
(III) Intrathoracic pressure of the lungs decreases
(IV) Diaphragm contraction
(V) Air rushes into the lungs
(A) (I) , (II) , (IV) , (V) , (III) (B) (I) , (II) , (III) , (IV) , (V)
(C) (I) , (IV) , (II) , (III) , (V) (D) (V) , (I) , (II) , (III) , (IV)

5. The structure which does not contribute to the breathing movements in mammals is
(A) Larynx (B) Ribs
(C) Diaphragm (D) Intercoastal muscle

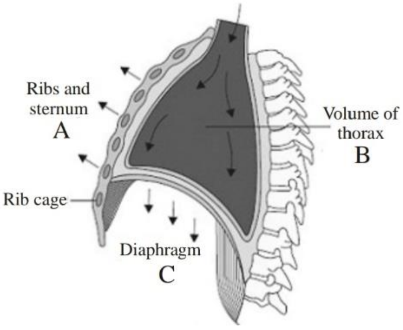
ANALYTICAL QUESTION

1. The given figure shows the respiratory system . identify the correct structure marked as 1 , 2 , 3 and 4 whose contraction initiated the inspiration which in turn increases the volume of thoracic chamber in the anterio-posterior axis



(A) 1-lung (B) 2-Diaphragm (C) 3-pleural membrane (D) 4- alveoli

2. The figure given below shows the mechanism of breathing . Identify the stage (X) of breathing explained and A , B and C marked in the figure

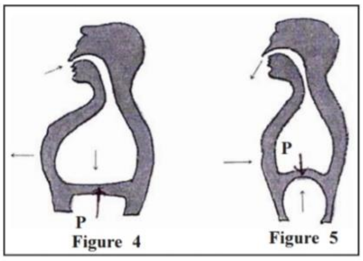


(A) X- expiration , A- raised , B – decreased , C -relaxed
(B) X- inspiration , A- raised , B – decreased , C -relaxed
(C) X- expiration , A- raised , B – increased , C – contracted
(D) X- inspiration , A- raised , B – increased , C – contracted

3. Which of the following are the stages of respiration in correct order ?
i) A-Gaseous exchange ii) B- cellular respiration
iii) C- Tissue respiration iv) D- breathing
(A) A-D-C-B (B) D-A-C-B (C) D-A-B-C (D) D-C-B-A

4. If the thoracic wall of lung is punctured then :
(A) The lungs get inflated (B) The man dies as the lungs get collapsed
(C) The breathing rate decreases (D) The breathing rate increases

5. What is not proper for Fig. 5 ?



(A) Relaxation of Diaphragm muscle (B) Partial pressure increase in lung
(C) Size of thoracic cavity reduces (D) Contraction of diaphragm muscle

ASSERTION AND REASON TYPE

(A) Both assertion and reason are true and the reason is correct explanation of the assertion
(B) Both assertion and reason are true but the reason is not the correct explanation of the assertion
(C) Assertion is true but reason is false
(D) Assertion and reason are false
(E) Assertion is false but reason is true

1. Assertion : the abdominal muscle are primarily involved in generating pressure gradient between the lungs and the atmosphere
   Reason : The strength of inspiration and expiration can be increased by additional muscle in diaphragm and intercoastal muscle .

2. Assertion :In mammals , complex respiratory system has developed .
   Reason : mammalian skin is impermeable to gases

3. Assertion : inspiration occurs due to muscular contraction
   Reason : during inspiration , the diaphragm and external intercoastal muscle contract simultaneously

4. Assertion : During inspiration , pressure of air falls in the thoracic region
   Reason : there is a rise in volume of thoracic region during inspiration

5. Assertion : Inspiration will not occur if diaphragm is elevated
   Reason : During inspiration diaphragm contracts and becomes flat